? IMPORTANT INFORMATIONKEEP FOR OPERATOR IMPORTANT INFORMATION

OPERATOR AND SERVICE MANUAL

OM/SM-TDH-CE

Part Number 128418

INTERNATIONAL

Model: TDH-CE Mark

Steam Jacketed Kettle

Self-contained
Stainless Steel
Gas Heated
Table Mounted
Tilting

Pull Tilt Model

Crank Tilt Model

KEEP THIS MANUAL WITH KETTLE DOCUMENTS. OPERATORS AND TECHNICIANS SHOULD READ, UNDERSTAND AND FOLLOW WARNINGS AND INSTRUCTIONS IN THIS MANUAL (THE SERVICE MANUAL AND THE OPERATOR SECTIONS).

GROEN®

Information contained in this document is known to be current and accurate at the time of printing/creation. Unified Brands recommends referencing our product line websites, unifiedbrands.net, for the most updated product information and specifications.

MADE IN USA™

IMPORTANT — READ FIRST — IMPORTANT

IT IS MOST IMPORTANT THAT THESE INSTRUCTIONS AND THE OPERATOR AND SERVICE MANUALS BE CONSULTED BEFORE INSTALLING AND COMMISSIONING THE APPLIANCE. FAILURE TO COMPLY WITH SPECIFIED PROCEDURES MAY RESULT IN DAMAGE OR THE NEED FOR A SERVICE CALL.

THESE APPLIANCES HAVE BEEN CE MARKED ON THE BASIS OF COMPLIANCE WITH THE GAS APPLIANCE DIRECTIVE, EMC AND LOW VOLTAGE DIRECTIVE FOR THE COUNTRIES, GAS TYPES AND PRESSURES AS STATED ON THE DATA PLATE.

THESE APPLIANCES MUST BE INSTALLED BY A COMPETENT PERSON IN CONFORMITY WITH INSTALLATION AND SERVICING INSTRUCTIONS AND NATIONAL REGULATIONS IN FORCE AT THE TIME. PARTICULAR ATTENTION MUST BE PAID TO THE FOLLOWING:

I. E. E. REGULATIONS FOR ELECTRICAL INSTALLATIONS
ELECTRICITY AT WORK REGULATIONS
GAS SAFETY (INSTALLATION AND USE) REGULATIONS
HEALTH AND SAFETY AT WORK ACT
LOCAL AND NATIONAL BUILDING REGULATIONS
FIRE PRECAUTIONS ACT

DETAILED RECOMMENDATIONS ARE CONTAINED IN INSTITUTE OF GAS ENGINEERS PUBLISHED DOCUMENTS: IGE/UP/1, IGE/UP/2, BS6173 AND BE5440. FURTHERMORE, IF A NEED ARISES TO CONVERT THE APPLIANCE FOR USE WITH ANOTHER GAS, A COMPETENT PERSON MUST BE CONSULTED. THOSE PARTS WHICH HAVE BEEN PROTECTED BY THE MANUFACTURER MUST NOT BE ADJUSTED BY THE USER.

USERS SHOULD BE CONVERSANT WITH THE APPROPRIATE PROVISIONS OF THE FIRE PRECAUTIONS ACT AND THE REQUIREMENTS OF THE GAS SAFETY REGULATIONS. IN PARTICULAR THEY SHOULD BE AWARE OF THE NEED FOR REGULAR SERVICING BY A COMPETENT PERSON TO ENSURE THE CONTINUED SAFE AND EFFICIENT PERFORMANCE OF THE APPLIANCE.

WARNING: TO PREVENT SHOCKS, ALL APPLIANCES GAS OR ELECTRIC, MUST BE EARTHED.

UPON COMPLETION OF THE INSTALLATION, THE OWNERS MANUAL SHOULD BE HANDED TO THE USERS AND THE INSTALLER SHOULD INSTRUCT THE RESPONSIBLE PERSON(S) IN THE CORRECT OPERATION AND MAINTENANCE OF THE APPLIANCE.
THIS EQUIPMENT IS ONLY FOR PROFESSIONAL USE, AND SHALL BE OPERATED BY QUALIFIED PERSONS. IT IS THE RESPONSIBILITY OF THE SUPERVISOR OR EQUIVALENT TO ENSURE THAT USERS WEAR SUITABLE PROTECTIVE CLOTHING AND TO DRAW ATTENTION TO THE FACT THAT, SOME PARTS WILL, BY NECESSITY, BECOME VERY HOT AND WILL CAUSE BURNS IF TOUCHED ACCIDENTALLY.

WARNING: BEFORE REMOVING ANY PARTITION OR PANEL, ALWAYS TURN OFF THE ELECTRIC POWER AND ALLOW THE FAN TO STOP ROTATING. BEFORE WORKING ON ANY ELECTRICAL COMPONENT, DISCONNECT THE POWER SOURCE FROM THE UNIT.

NOTE: IT IS IMPORTANT THAT THE END-USER ROUTINELY EXAMINE THE FLUE OUTLET ON A REGULAR BASIS. DEBRIS COVERING THE FLUE OUTLET CAN CAUSE A POTENTIALLY HAZARDOUS CONDITION. REMOVE ANY FOREIGN MATERIAL BEFORE USING THIS PIECE OF EQUIPMENT.

WARNINGS AND CAUTIONS PROVIDED IN THIS OPERATOR AND SERVICE MANUAL MUST BE COMPLIED WITH.

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Regulations and Safety Precautions

These Appliances have been CE marked on the basis of compliance with the Gas Appliance Directive, EMC and Low Voltage Directive for the Countries, Gas Types and Pressures as stated on the Data Plate.

These appliances MUST BE installed by a competent person in conformity with the INSTALLATION AND SERVICING INSTRUCTIONS and National Regulations in force at the time.

Particular attention MUST be paid to the following:

I.E.E. Regulations for Electrical Installations
Electricity at Work Regulations
Gas Safety (Installation & Use) Regulations
Health and Safety at Work Act
Fire Precautions Act
Local and National Building Regulations

Furthermore, if a need arises to convert the Appliance for use with another gas, a competent person must be consulted. Those parts which have been protected by the manufacturer MUST NOT be adjusted by the User.

Users should be conversant with the appropriate provisions of the Fire Precautions Act and the requirements of the Gas Safety Regulations. In particular the need for regular servicing by a competent person to ensure the continued safe and efficient performance of the Appliance.

WARNING
TO PREVENT SHOCKS, ALL APPLIANCES WHETHER GAS OR ELECTRIC, MUST BE EARTHED.

Upon completion of the installation, the Owners Manual should be handed to the users and the installer should instruct the responsible person(s) on the correct operation and maintenance of the Appliance. This equipment is ONLY FOR PROFESSIONAL USE, and shall be operated by QUALIFIED persons. It is the responsibility of the Supervisor or equivalent to ensure that users wear SUITABLE PROTECTIVE CLOTHING and to draw attention to the fact that, some parts will, by necessity, become VERY HOT and will cause burns if touched accidentally.

IMPORTANT - READ FIRST - IMPORTANT The Groen Steam Jacketed Kettle you have just purchased has been handcrafted from the finest materials, meticulously inspected, and carefully tested to ensure that you receive the best possible product. With reasonable care and periodic maintenance, it will provide years of faithful service. It is recommended that you establish a timetable for periodic maintenance as outlined in this manual. Space has been provided in the Maintenance & Service Log in the User Instructions section (Page 23). Keep it up-to-date and on file.

1. Installation

UNLESS OTHERWISE STATED, PARTS WHICH HAVE BEEN PROTECTED BY THE MANUFACTURER ARE NOT TO BE ADJUSTED BY THE INSTALLER.

1.1 Model Numbers, Net Weights and Dimensions

MODEL ,	**TDH - 20**	**TDH - 40**
WIDTH mm (in)	610 (24.0)	685 (26.9)
DEPTH mm (in)	800 (31.5)	830 (32.6)
HEIGHT mm (in)	645 (25.4)	725 (28.5)
WEIGHT kg (lbs)	98 (215)	110 (240)

1.2 Siting

The appliance should be installed on a level table top in a well lit and draught free position. The installation of the appliance must be executed in accordance with local and/or national regulations as listed in this manual.

1.3 Clearances

Minimum clearances of 150 mm (5.9 in) from the sides of the appliance and 250 mm (9.8 in) from the rear of the appliance are required if the appliance is installed next to combustible surfaces.

A vertical clearance of 750 mm (29.6 in) minimum should be allowed between the top rim of kettle and any overlying surface.

1.4 Ventilation

The unit must be installed in an adequately ventilated room with provision for an adequate air supply to the unit. The area directly around the appliance must be cleared of combustible material. For multiple installations, requirements for individual appliances should be added together. Installation should be made in accordance with local and/or national regulations applying at the time. A competent installer must be employed.

Recommendations for ventilation for catering appliances are given in BS 5440:2 and are shown in the following table.

CAUTION
THE APPLIANCE FLUE DISCHARGES VERTICALLY FROM THE TOP OF THE UNIT AT THE REAR. IT MUST NOT BE DIRECTLY CONNECTED TO ANY FLUE, MECHANICAL EXTRACTION SYSTEM, OR DUCTING LEADING OUTSIDE THE BUILDING. THE APPLIANCE IS BEST DISCHARGED UNDER AN OPEN CANOPY WHICH CONNECTS WITH A VENTILATING SYSTEM.

Equipment	**Ventilation Rate Required**	
	m^3 / min	**ft^3 / min**
Units Type Range	17	600
Pastry Oven	17	600
Fryer	26	900
Grill	17	600
Steak Grill	26	900
Boiling Pan	17	600
Steamer	17	600
Sterilizing Sink	14	500
Bains Marie	11	400
Tea/Coffee Machine	8.5-14	300-500

1.5 Electrical Supply

This unit is designed for connection to fixed wiring. A suitably rated isolating switch with contact separation of at least 3 mm (0.12 in) on both poles must be fitted to the installation. The wiring must be executed in accordance with the regulations listed in this manual.

Cable entry is at the lower rear on right side of the appliance. Access to the terminals is gained by removing relevant panels. (Paragraphs 3.5.1 and 3.5.2)

Provide 230 VAC, 50 Hz, 1 Phase, 1 Amp or 40 Watts. The electrical schematic is located in the service compartment and in this manual.

WARNING
THIS APPLIANCE MUST BE EARTHED.

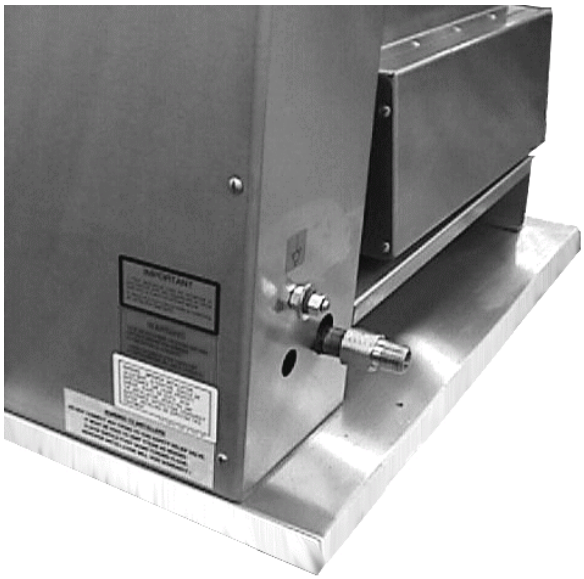
1.6 Gas Supply

Incoming gas service must be of sufficient size to supply full rate without excessive pressure drop. A gas meter is connected to the service pipe by the Gas Supplier. Any existing meter should be checked by the Gas Supplier to ensure that it has capacity to pass the required rate of gas for the kettle in addition to any other gas equipment installed.

The appliance governor is incorporated in the gas control valve which is situated in the control cabinet. The control valve governor is suitable for both natural and propane gases without any conversion.

Installation pipe work should be fitted in accordance with IEGE/UP/2. The pipe work should not be smaller than the gas inlet connection on the kettle, i.e. Rp ½ (½"BSPT).

An isolating cock must be located close to the appliance to allow shut off during an emergency or servicing. The installation must be tested for gas soundness and purged as specified in IGE/UP.



1.7 Total Gas Rate - Natural and Propane Gas

Model	Kw	BTU/hr
TDH-20	8.2	28,000
TDH-40	14.3	48,800

Water Supply — Not applicable to these appliances.

1.8 Injector Diameters-Natural and Propane Gas

Injector	TDH-20	TDH-40
G20 Nat. Gas	0.94 mm	1.09 mm
No. of Orifices	8	12
G25 Nat. Gas	1.09 mm	1.19 mm
No. Of Orifices	8	12
G31 Propane Gas	0.57 mm	0.66 mm
No. of Orifices	8	12

Pilot Orifice : NATURAL - Honeywell CAR 24; PROPANE -Honeywell BBR 10

1.9 Gas Pressure Adjustment

A pressure test point is fitted on the burner manifold and on the gas control valve.

		TDH-20	TDH-40
G20, G25 NATURAL GAS	mbar	8.75	8.75
	in. w.c.	3.5	3.5
G31 PROPANE GAS	mbar	25	25
	in. w.c.	10	10

NOTE: With reference to the gas rate, pressure adjustments and conversions, this appliance is approved for use with the following gases:

a) G20 natural gas may be supplied to the appliance in Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

b) G25 natural gas may be supplied to the appliance in Belgium, France and the Netherlands.

c) G31 propane gas may be supplied to the appliance in France, Germany, Ireland, the Netherlands, Portugal, Spain, Switzerland and the United Kingdom.

Use of the appliance with non-approved gases in a listed country, or use in other countries will void CE certification.

2. Assembly and Commissioning

2.1 Assembly

a) Unpack the appliance

b) Place on a firm, level table.

2.2 Gas Supply

Connect the unit to the gas supply and test for gas soundness. For that part of the integral gas supply down stream of the gas valve, leak detection spray or soap solution may be used with the burners lit.

CAUTION
ENSURE THAT THE PAN CONTAINS LIQUID WHEN THE BURNERS ARE ALIGHT.

2.3 Electrical Supply

Before commissioning the appliance, ensure that the electrical installation has been carried out according to relevant regulations. (Paragraph 1.5.).

WARNING
THIS APPLIANCE MUST BE EARTHED.

2.4 Jacket Water Level/Jacket Pressure

a) Ensure that the jacket water level is correct by confirming that the level is in the middle of the sight glass. If the water is low, follow the instructions under "Jacket Filling" (Paragraph 3.3).

b) Check the pressure gauge. If the gauge does not show 20 or more inches of vacuum (that is, a reading of 20 to 30 below zero) see "Jacket Vacuum" (Paragraph 3.2).

2.5 Pre-Commissioning Check

a) Prior to operation, clean out kettle pan thoroughly using hot water and detergent. Rinse pan thoroughly.

b) Remove all literature and packing materials from the interior and exterior of the unit.

c) Ensure the open end or the elbow at the outlet of the safety valve is directed down. If it is not, turn the elbow to the correct position.

2.5.1 Lighting Sequence

Initial Start Up:

a) Put a small amount of water in the kettle pan.

b) Ensure gas and electricity mains are on.

c) Switch the toggle switch to the "on" position.

d) Turn thermostat dial to desired setting.

e) Verify that the spark igniter lights the burners.

f) If the unit does not light, the unit will lock-out. Turn the unit off and wait 1-2 minutes before attempting to switch the unit on again.

g) Press reset lock-out switch and repeat steps (b) to (e).

h) To turn the unit off, switch toggle (On/Off) switch to the “Off” position.

i) Turn gas and electricity mains off.

2.5.2 Setting The Gas Pressure

a) It is necessary to check the gas pressure during commissioning. A suitable pressure gauge must be connected to the pressure test point on the gas control valve or the gas manifold. See below for test points on the gas control valve.

When checking pressure at test points on the gas valve, undo the screw a half turn and slip tube over nipple.

b) Turn the gas and electricity mains on.

c) Light the burners (Paragraph 2.5.1).

d) Remove control cabinet lid (Paragraph 3.5.1).

e) Remove control cabinet side panel (Paragraph 3.5.2).

f) Remove governor cap screw on gas control valve. See figure below for position.

g) Governor is suitable for natural or propane gas.

h) To increase pressure turn screw inside the governor turret clockwise or anti-clockwise to reduce pressure. Check the burner pressure again after 15 minutes of operation and adjust if necessary.

i) Disconnect the pressure gauge from the test point.

j) Re-seal the pressure test point and test for gas soundness. Replace in reverse order.

2.5.3 Checking Performance of Controls

a) Light the unit as described in Paragraph 2.5.1. Check that the controls produce a healthy spark from the electrode to the earthing post and ignition is smooth and without delay.

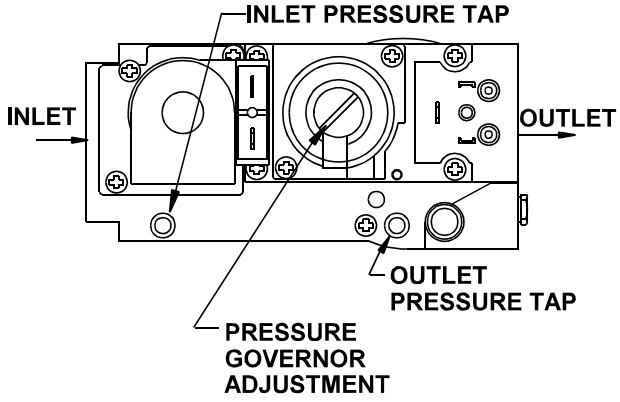
b) Turn thermostat off and then on. Check that burners go out when the thermostat is switched off and then ignite smoothly and without delay when switched back on. Repeat several times.

c) If the unit fails to respond as detailed above it should be serviced by an authorized Groen service agent.

2.6 Instruction to User

Important

After installing and commissioning the appliance, the user's instructions should be handed to the user or purchaser. Ensure that instructions for lighting, turning off, correct use and cleaning are properly understood. Emphasis should be made with regard to the location of the main gas isolating valve and the emergency shut-down procedure should be demonstrated.



3. Servicing and Conversion

Important

Before attempting any servicing, ensure that the gas isolating cock is turned off and cannot be inadvertently turned on. Disconnect the electricity supply.

After any maintenance task, check the appliance to ensure that it performs correctly. Carry out necessary adjustments as detailed in Section 1.

After any servicing or exchange of gas carrying components:

ALWAYS CHECK FOR GAS SOUNDNESS

NOTE: *When replacing wiring connections refer to the wiring diagram contained on the unit and in this manual.*

After Servicing

a) Test for gas soundness as specified in IGE/UP1 as appropriate after any gas connection has been disturbed.

b) Check for correct operation, as appropriate (see commissioning of appliance).

Regular Servicing Procedures

The following must be serviced at regular intervals.

Burners

The burner should be cleaned periodically to maintain maximum performance. Burners are best cleaned with a wire brush. Any blocked parts are best cleaned with a metal broach, taking care not to damage the burner head.

The injector orifice should be cleaned with a wooden splinter. Metal reamers could distort or increase the orifice size and should be avoided.

Gears

The gear housing has fittings for lubrication of moving parts. Because the gears do not run in oil, periodic lubrication with grease is necessary. Lubrication frequency depends on operating conditions, but should be performed at least once every six months. A #2 grade LGI lithium grease is recommended. Add grease through the Zerk fittings on the gear housing until grease flows out of the bearings around the shaft. Put a liberal amount of grease on the gear to cover the arc of contact with the gear.

Safety Valve

At least twice monthly the safety valve requires checking to ensure that it works correctly. With the gauge pressure at about five PSIG, lift the valve level enough to vent steam, then quickly let it snap back into place.

WARNING
AVOID ANY EXPOSURE TO THE STEAM BLOWING OUT OF THE SAFETY VALVE.

This procedure should be explained to the user, since it is to be carried out at least twice a month. Relevant safety procedures and requirements should also be explained to the user when carrying out the procedure.

3.1 Conversion

See Paragraphs 1.8 and 1.9 for important information about gas conversion. Verify the type of gas to be used. All conversions must be for approved gas in countries listed in Paragraph 1.9.

To change from natural gas to propane gas or vice versa change

Burner Injector
Pressure Setting
Data Plate
Pilot Orifice

The governor spring does not require changing, only the pressure setting.

IMPORTANT

This appliance was fitted with gas injectors for type G20 natural gas at the factory. Injectors for type G25 natural gas are shipped as an accessory. Prior to installing equipment, or when converting to another gas, verify that the injector gas size marking on the injector matches

information on the data plate for the type of gas being used.

3.2 Jacket Vacuum

When the kettle is cold, a positive reading or a reading near zero on the pressure vacuum gauge indicates excess air in the jacket. Air in the jacket slows down kettle heating.

To remove air:

a) Light the unit (Paragraph 2.5.1).

b) When the pressure/vacuum gauge reaches a positive pressure reading of five PSIG, release entrapped air and steam by lifting the lever on the safety valve for about one second. Repeat this a few times. Let the valve snap back into the closed position.

WARNING
AVOID ANY EXPOSURE TO THE STEAM BLOWING OUT OF THE SAFETY VALVE.

3.3 Jacket Filling

The jacket has been charged at the factory with the proper amount of treated, distilled water. You may need to restore jacket water to its proper level, either because water was lost as steam during venting or by draining.

To add water:

a) If you are replacing water lost as steam use distilled water. If you are replacing treated water that ran out of the jacket, prepare more treated water (Paragraph 3.4).

b) Let the kettle cool completely. Turn the safety valve elbow anti-clockwise (to avoid thread damage) until it faces upward.

c) Open the globe valve and pour distilled or treated water into the elbow inlet.

d) Hold the safety valve open while you pour to let air escape from the jacket. Air introduced during filling must be removed to obtain efficient heating (Paragraph 3.2).

CAUTION
TDH STEAM JACKETED KETTLES ARE DESIGNED TO USE TREATED, DISTILLED WATER ONLY. USE OF ANY OTHER WATER CAN CAUSE LIME ACCUMULATION ON INTERNAL SURFACES, AND WILL VOID ALL WARRANTIES.

3.4 Water Treatment Procedure

WARNING
READ AND FOLLOW ALL PRECAUTIONS STATED ON THE WATER TREATMENT COMPOUND LABEL TO AVOID INJURY.

a) Fill the mixing container with the measured amount of water required (See Table below). Use distilled water only.

b) Hang a strip of pH test paper on the rim of the container, with about 1"(25 mm) of the strip below the water surface.

c) Measure the water treatment compound (e.g., add the compound to the water from a small measuring cup).

d) Stir the water continuously while you slowly add water treatment compound, until the water reaches a pH between 10.5 and 11.5. Judge the pH by frequently comparing the color of the test strip with the color chart provided in the pH test kit.

e) Record the exact amounts of water and treatment compound used. These amounts may be used again if the same sources of water and compound are used in the future. However, it is advisable to check the pH every time water is prepared. For optimum performance, use correctly treated distilled water.

Model	Kettle Capacity	Jacket Capacity
TDH-20	18.9 Litres	6.6 Litres
TDH-40	37.9 Litres	8.5 Litres

3.5 Remove Control Panels

3.5.1 Remove Control Cabinet Lid (Turn gas and electric mains off)

a) Remove the 2 screws around the edge of the lid securing it to the control cabinet.

b) Remove the lid.

c) Replace in reverse order.

3.5.2 Remove Control Cabinet Side Panel (Turn gas and electric mains off)

a) Remove lid (Paragraph 3.5.1).

b) Remove the four screws securing the side panel to the control cabinet.

c) Remove panel.

d) Replace in reverse order.

3.6 Remove Spark Ignition Module (Turn gas and electric mains off)

a) Remove control cabinet lid (Paragraph 3.5.1).

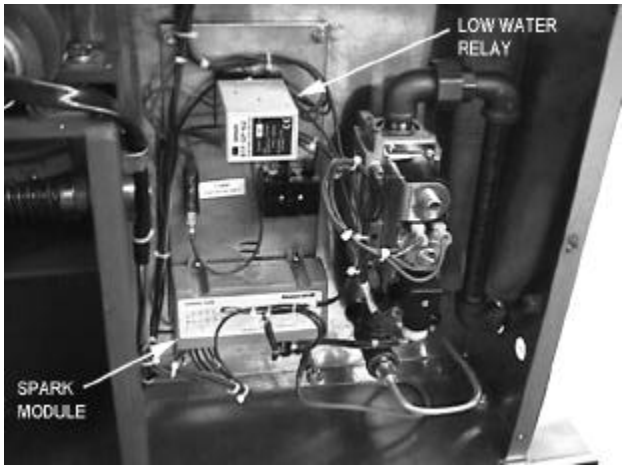
b) Remove cabinet side panel (Paragraph 3.5.2).

c) Disconnect leads from spark ignition module.

d) Remove retaining screws securing spark ignition module.

e) Withdraw spark ignition module from control cabinet.

f) Replace in reverse order.



3.7 Remove Low Water Level Control Relay (Turn gas and electric mains off)

a) Remove control cabinet lid (Paragraph 3.5.1).

b) Remove cabinet side panel (Paragraph 3.5.2).

c) Remove low water level control from its base by undoing the two retaining clips.

d) Replace in reverse order.

Ensure the low water level control relay is correctly oriented when re-positioned.

3.8 Remove Tilt Switch (Turn gas and electric mains off)

a) Remove control cabinet lid (Paragraph 3.5.1).

b) Remove control cabinet side panel (Paragraph 3.5.2).

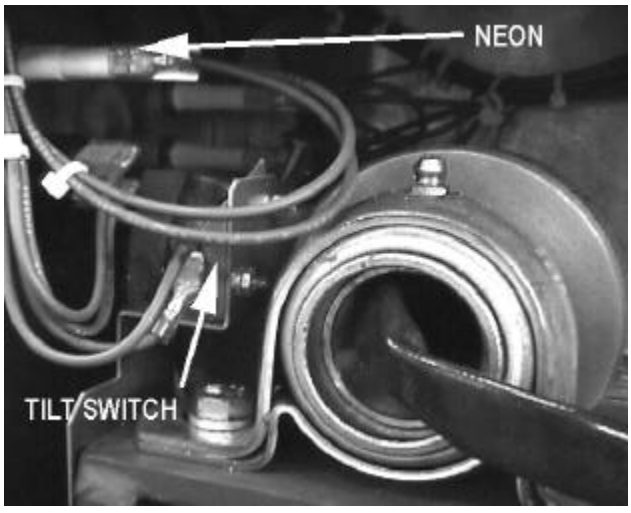
c) Disconnect electrical leads from tilt switch.

d) Remove screws securing the tilt switch bracket assembly.

e) Withdraw tilt switch bracket assembly from control cabinet.

f) Remove screws securing the switch from the bracket.

g) Replace in reverse order.



3.9 Remove Gas Control Valve (Turn gas and electric mains off)

a) Remove control cabinet lid (Paragraph 3.5.1).

b) Remove control cabinet side panel (Paragraph 3.5.2).

c) Tilt kettle until the burners are fully exposed and disconnect the pilot assembly from the burner guard.

d) Remove the nuts securing the burner guard to the appliance base and remove the burner guard.

e) Undo the union fittings on either side of the control valve and disconnect the electrical leads from the control valve.

f) Remove control valve from control cabinet.

g) Replace in reverse order.

3.10 ON/OFF Switch and Reset Button (Turn gas and electric mains off)

a) Remove control cabinet lid (Paragraph 3.5.1).

b) Remove cabinet side panel (Paragraph 3.5.2).

c) Disconnect electrical leads from the On/Off switch or reset button.

d) Undo and remove retaining collar securing the On/Off switch to the control cabinet outer surface, and securing the reset button to the inner surface of the control cabinet.

e) Withdraw the On/Off switch or reset button as required.

f) Replace in reverse order.

3.11 Remove Neons (Turn gas and electric mains off)

a) Remove control cabinet lid (Paragraph 3.5.1).

b) Remove cabinet side panel (Paragraph 3.5.2).

c) Disconnect the electrical leads to the neon.

d) Undo and remove the retaining collar which secures the neon to the control cabinet.

e) Withdraw the neon from the control cabinet.

f) Replace in reverse order.

3.12 Remove Thermostat (Turn gas and electric mains off)

a) Remove panel from kettle base by undoing the retaining screws.

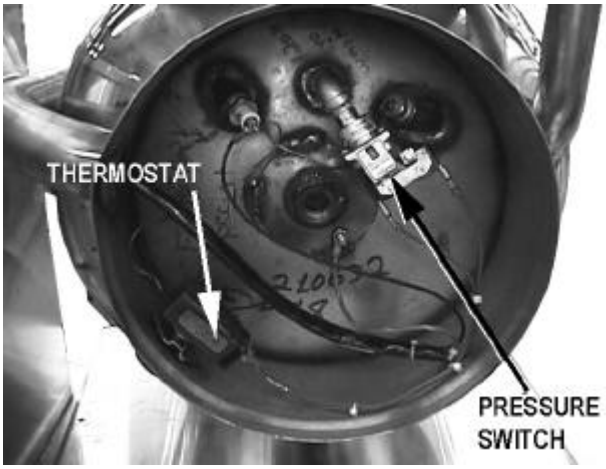
b) Drain kettle by tilting it slightly and undoing Phial Boss connection. Allow kettle to drain into a suitably sized container.

WARNING
ENSURE THAT ELECTRICAL LEADS AND CONNECTIONS IN THE KETTLE BASE DO NOT GET WET. REMOVE IF REQUIRED.

Important:- Retain drained water from kettle jacket. The jacket was charged at the factory with the correct amount of treated distilled water. This water should be used to refill the kettle. However, if water is lost during drainage see Paragraph 3.3, Jacket Filling.

c) Remove thermostat control knob and disconnect electrical leads.

d) Undo and remove thermostat retaining screws which hold the thermostat to the kettle base control compartment.



e) Remove thermostat phial from kettle base and withdraw the thermostat.

f) Replace in reverse order.

g) Ensure an adequate sealant is used to seal the replacement thermostat Phial Boss.

h) Once the thermostat is in place, the jacket should be refilled. (Paragraph 3.3).

Always refer to the wiring diagram when reconnecting electrical leads. The wiring diagram is located inside the appliance and at the rear of this manual.

3.13 Remove Pressure Switch

a) Remove panel from base of kettle by undoing the retaining nut.

b) Disconnect pressure switch electrical leads.

c) Remove the microswitch and retaining bracket. This will allow the pressure sensor section to be removed from the kettle base.

d) Allow the kettle to drain by undoing the pressure switch connection in the kettle base. Drain into a suitably sized container.

WARNING
ENSURE THAT ELECTRICAL LEADS AND CONNECTIONS IN THE KETTLE BASE DO NOT GET WET. REMOVE IF REQUIRED

e) Remove and withdraw the pressure sensor section from the kettle base.

f) Replace in reverse order.

g) Once the pressure switch is in place, the jacket should be refilled (Paragraph 3.3).

3.14 Remove Low Water Level Sensor **(Turn gas and electric mains off)**

a) Remove panel from base of kettle by undoing the retaining screws.

b) Disconnect the electrical leads from the water level sensor.

c) Drain the kettle by tilting the kettle slightly and undoing the low water level sensor. Allow the kettle to drain into a suitably sized container.

d) Remove the low water level sensor from the kettle base.

e) Replace in reverse order

f) Ensure a suitable sealant is used to seal the low water level sensor Boss.

g) Once the low water level sensor is in place, the jacket should be filled (Paragraph 3.3).

3.15 Remove Burners **(Turn gas and electric mains off)**

a) Tilt the kettle until the burners are fully exposed.

b) Disconnect the pilot assembly from the burner guard.

c) Remove the retaining nuts securing the burner guard to the appliance base.

d) Remove the burner guard.

e) The burners are now accessible and can be removed as required.

f) Replace in reverse order.

g) Ensure adequate sealant is used to seal the burners.

ALWAYS CHECK FOR GAS SOUNDNESS WHEN ANY PART OF THE GAS CIRCUIT HAS BEEN DISTURBED.

3.16 Remove Pilot Assembly/Pilot Injector **(Turn gas and electric mains off)**

a) Undo pilot pipe compression fitting.

b) Remove pilot pipe from pilot assembly

c) If the pilot injector is to be changed, it may be done at this stage. Remove the pilot injector from the pilot assembly. Change, clean or replace as required.

d) If the pilot assembly is to be removed then remove the flame sensing electrode wire (HT lead) from the flame sensing electrode.

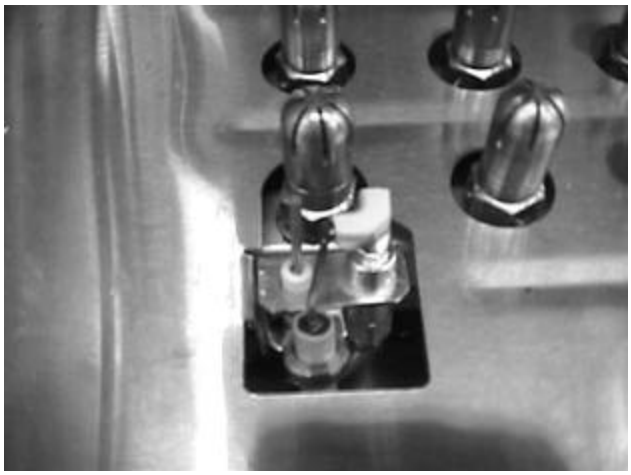
e) Remove the two retaining screws securing the pilot assembly to the burner guard.

f) Withdraw the pilot assembly from the burner guard/combustion chamber.

g) Disconnect the spark electrode HT lead from the ignition module and feed through control cabinet wall.

h) Withdraw pilot assembly from the appliance.

i) Replace in reverse order.



3.17 Spark Electrode/Flame Sensing Bracket (Turn gas and electric mains off)

a) Remove pilot assembly (Paragraph 3.16).

b) Undo retaining screws securing the flame sensing electrode to the pilot assembly.

c) The spark electrode is fitted to the pilot assembly, therefore a new pilot assembly is required.

d) Replace spark electrode and pilot assembly as required.

e) Replace in reverse order. The spark gap should be pre-set with no adjustment required.

Note: After fitting, ensure there is an adequate spark between the pilot shroud and the spark electrode. Also ensure that the sensing electrode is positioned in the pilot flame.

3.18 Remove Pressure Gauge (Turn gas and electric mains off)

a) Using the correctly-sized spanner, remove the pressure gauge from the kettle jacket pipework.

b) Replace with new pressure gauge ensuring that an adequate sealing compound is used.

c) Once the pressure gauge has been replaced the kettle jacket will need to be vented. (Paragraph 3.2).

3.19 Remove Sight Glass (Turn gas and electric mains off)

a) Undo the sight glass and allow the contents of the kettle jacket to drain into a suitably sized container.

b) Completely remove the sight glass.

c) Replace in reverse order.

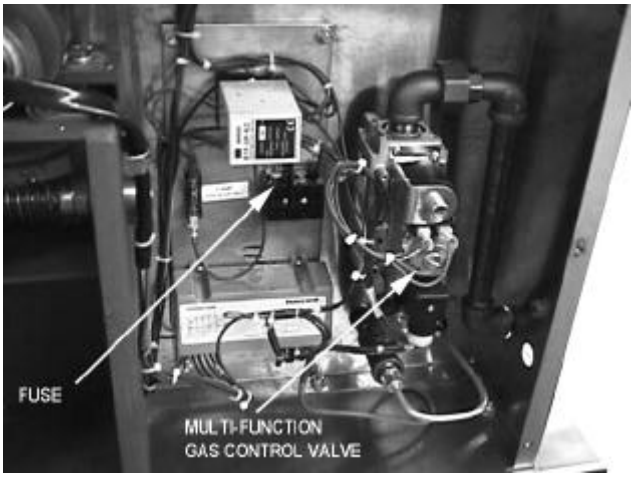
d) Ensure an adequate sealant is used to seal the sight glass.

e) Once the jacket has been drained and the sight glass replaced, the jacket will need filling (Paragraph 3.3).

3.20 Multi-Function Gas Valve (Turn gas and electric mains off)

a) Remove the elbow from the gas control valve.

b) Remove the gas control valve from kettle jacket pipework.



c) Replace in reverse order.

d) Ensure an adequate sealing compound is used to seal the gas control valve.

3.21 Filling Valve (Turn gas and electric mains off)

a) Remove filling valve from kettle jacket pipework.

b) Replace in reverse order.

c) Ensure adequate sealing compound is used to seal the valve.

d) Once the safety fill is replaced the jacket will need to be vented (Paragraph 3.2).

3.22 Fuse Replacement (Turn gas and electric mains off)

a) Remove control cabinet lid (Paragraph 3.5.1).

b) Remove control cabinet side panel (Paragraph 3.5.2).

c) Remove fuse from vertical fuse holder.

d) Replace fuse (identical to fuse removed).

e) Replace in reverse order.

4. Troubleshooting

Your Groen kettle is designed to operate smoothly and efficiently if properly maintained. However, the following are checks to make in the event of a problem. Wiring diagrams are inside the service panel and in the back of this manual. **USE OF ANY REPLACEMENT PARTS OTHER THAN THOSE SUPPLIED BY GROEN OR THEIR AUTHORIZED DISTRIBUTORS CAN CAUSE INJURY TO THE OPERATOR AND DAMAGE TO THE EQUIPMENT AND WILL VOID ALL WARRANTIES.**

SYMPTOM	WHO	WHAT TO CHECK
Kettle is hard to tilt.	Auth Service Rep Only	a. Gears for foreign materials, lubrication, and alignment
Burners will not light.	User	a. That the main gas supply cock is open (handle is in line with the gas pipe.) b. Gas supply to the building. c. That the kettle body is not tilted. d. That electric power supply to the unit is on.
	Auth Service Rep Only	e. Thermostat operation. f. That the tilt limit switch is closed, when the kettle body is not tilted.
Kettle continues heating after it reaches the desired temperature	User	a. Thermostat dial setting.
	Auth Service Rep Only	b. Thermostat calibration. c. Thermostat operation.
Kettle stops heating before it reaches the desired temperature.	User	a. Thermostat dial setting.
	Auth Service Rep Only	b. Thermostat calibration. c. Thermostat operation.
Kettle heats slowly.	User	a. For air in jacket (Paragraph 3.2).
Safety valve pops.	User	a. For air in jacket (Paragraph 3.2).
	Auth Service Rep Only	b. Safety valve. If valve pops at pressures below 49 PSIG, replace it. c. If high limit pressure switch is set too high. d. Thermostat operation

SYMPTOM	WHO	WHAT TO CHECK
System does not produce a spark.	Auth Service Rep Only	a. Thermostat, and close the contacts, if they are open. b. AC voltage between terminals “1" and GND. If it is not 230 VAC, check the high limit switch, which should be closed c. Pilot spark gap. Regap, if it is not 7/64 inch (2.78 mm). d. Electrode ceramic for crack or break. e. That the high tension cable is firmly attached and in good condition. If it is cracked or brittle, replace the pilot. f. Replace the electronic spark ignition module.
Spark is present, but the pilot will not light.	Auth Service Rep Only	a. That the gas valve is opening. b. That gas pressure meets the control manufacturer’s specifications. c. For gas at the pilot. If it is not flowing: (1) Check the pilot gas line for kinks and obstructions. (2) Replace the gas control valve. d. That the pilot spark gap is 7/64 inch (2.78 mm) and located in the pilot gas stream. If not, adjust or replace the pilot. e. Orifice, and clean, if necessary
Pilot lights, but main burner will not come on, and the spark stays on.	Auth Service Rep Only	a. Sensor cable, to make sure of secure attachment to terminal “1" on module and to the sensor. b. Sensor ceramic for cracks. c. That the cable is not grounded out. If it is, correct the ground. d. Sensor cable for continuity and condition of insulation. e. (1) Check the gas pressure. (2) Clean the pilot assembly. (3) Tighten mechanical and electrical connections.
Pilot lights, but main burner will not come on, and spark does not stay on.	Auth Service Rep Only	a. That gas pressure meets the control manufacturer’s specifications. b. Replace spark ignition module.
Main burner comes on but will not stay lit.	Auth Service Rep Only	a. Check burner ground for bad wire or connection. Replace with high temperature wire if necessary. b. Check for low gas supply pressure. If necessary, replace ignition control module. c. Ceramic insulator or pilot flame sensor cracked. Replace flame sensor.

5. User Instructions

Regulations and Safety Precautions

These Appliances have been CE marked on the basis of compliance with the Gas Appliance Directive, EMC and Low Voltage Directive for the Countries, Gas Types and Pressures as stated on the Data Plate.

These appliances MUST BE installed by a competent person in conformity with the INSTALLATION AND SERVICING INSTRUCTIONS and National Regulations in force at the time.

Particular attention MUST be paid to the following:

I.E.E. Regulations for Electrical Installations
Electricity at Work Regulations
Gas Safety (Installation & Use) Regulations
Health and Safety at Work Act
Fire Precautions Act
Local and National Building Regulations

Furthermore, if a need arises to convert the Appliance for use with another gas, a competent person must be consulted. Those parts which have been protected by the manufacturer MUST NOT be adjusted by the User.

Users should be conversant with the appropriate provisions of the Fire Precautions Act and the requirements of the Gas Safety Regulations. In particular the need for regular servicing by a competent person to ensure the continued safe and efficient performance of the Appliance.

WARNING
TO PREVENT SHOCKS, ALL APPLIANCES WHETHER GAS OR ELECTRIC, MUST BE EARTHED.

Upon completion of the installation, the Owners Manual should be handed to the users. Tthe installer should instruct responsible person(s) on the correct operation and maintenance of the Appliance. This equipment is ONLY FOR PROFESSIONAL USE, and shall be operated by QUALIFIED persons. It is the responsibility of the Supervisor or equivalent to ensure that users wear SUITABLE PROTECTIVE CLOTHING and to draw attention to the fact that, some parts will, by necessity, become VERY HOT and will cause burns if touched accidentally.

IMPORTANT - READ FIRST - IMPORTANT The Groen Steam Jacketed Kettle you have just purchased has been handcrafted from the finest materials, meticulously inspected, and carefully tested to ensure that you receive the best possible product. With reasonable care and maintenance, it will provide years of faithful service. It is recommended that you establish a timetable for periodic maintenance as outlined in this manual. Log space has been provided in this manual. Keep it up-to-date and on file.

5.1 Equipment Description

5.1.1 General

Groen model TDH are stainless steel, steam jacketed, table-top mounted, tilting kettles with a self-contained, gas-heated steam source. The kettle body is welded into one piece and furnished with a reinforced bar rim and welded "butterfly" pouring lip. The interior of the kettle is polished to a 180 emery grit finish, and the exterior is given a bright semi-deluxe finish. The unit is ASME shop inspected and registered with the National Board for working pressures up to 50 PSIG. Kettle support, tilting mechanism, and controls are contained in an enclosed compartment resting on a base plate. Tilting is provided by a self-locking, worm-and-gear device, or a pull tilt handle.

The self-contained steam source is heated by propane or natural gas and ignition is by electronic spark.

Charged at the factory with treated, distilled water, the steam source provides kettle temperature of 65°C to 150°C. Controls include a thermostat, pressure gauge, gauge glass, safety valve, pressure limit control, low water cut-off, on/off switch and a multi-functional gas control valve.

The gas supply shuts off automatically when the kettle is tilted.

Service connections are required for gas and 230-V, single phase, 50 Hz electricity.

Important:

Prior to operation, clean out the kettle pan thoroughly using hot water and detergent. Rinse out and dry thoroughly.

The gas burners are protected by an electronic flame failure device which incorporates automatic ignition of the burners and instant shut-off of the gas supply to the burners should a gas supply interruption occur.

5.1.2 Available Options

Options available with listed models include:

a) One piece, lift-off cover.

b) Basket inserts.

c) Stand that supports the unit and holds a pan in position for filling.

d) Fill faucet with swing spout.

e) Kettle Brush Kit.

5.1.3 Operational and Maintenance Safety

WARNING

INSTALLATION OF THE UNIT MUST BE DONE BY PERSONNEL QUALIFIED TO WORK WITH ELECTRICITY AND PLUMBING IN ACCORDANCE WITH ALL APPLICABLE CODES.

BEFORE REPLACING ANY PARTS, DISCONNECT THE UNIT FROM THE ELECTRIC POWER SUPPLY AND CLOSE THE MAIN GAS COCK. ALLOW FIVE MINUTES FOR UNBURNED GAS TO VENT.

TO PREVENT SHOCKS, ALL APPLIANCES WHETHER GAS OR ELECTRIC, MUST BE EARTHED.

CAUTION

OPERATORS MUST READ, UNDERSTAND AND FOLLOW CAUTIONS AND SAFETY AND OPERATING INSTRUCTIONS CONTAINED IN THIS MANUAL.

5.2 Lighting and Operation

5.2.1 Initial Kettle Lighting and Operational Readiness Check

After the TDH Kettle has been installed according to service and installation instructions, perform initial start-up as a test to ensure that the unit is operating correctly. Follow the steps below. TDH steam jacketed kettle controls and indicators are identified in the drawing below.

a) Remove all literature and packing material from the interior and exterior of the unit.

b) Make sure gas and electricity supplies are turned on.

c) Ensure that the kettle is filled with water before lighting.

d) Check the water level in the jacket. The level should be between the lines on the gauge glass. If the level is low, the jacket water level will be required to be topped up. (This will require a service call).

e) Check the pressure gauge. If the gauge does not show sufficient vacuum (20 to 30 below zero) the jacket will require venting. (This will require a service call).

f) Switch the On/Off switch to the "On" position. The “power on” neon will illuminate.

g. Turn the thermostat dial to the required setting.

h. After 10-15 seconds the burners should light. The "heat on" neon will illuminate.

i. In the event the burners do not light, or go out as indicated by the illumination of the lockout indicating neon, turn the unit off. Wait approximately one minute. Press lockout reset switch and repeat steps (f) to (g).

WARNING
AVOID CONTACT WITH FLUE. SURFACES ARE VERY HOT AND WILL CAUSE BURNS.

DO NOT OBSTRUCT FLUE EXHAUST OPENING.

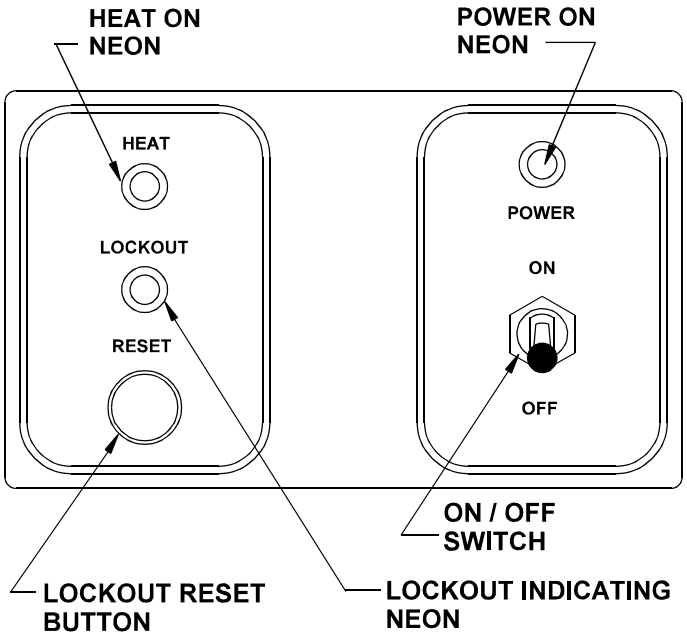
5.2.2 To Shut Down Kettle

a. Turn the thermostat dial to the “Off” position

b. Turn the On/Off switch to the “Off” position

c. For a prolonged shut down:

Follow steps a and b. Turn off the gas and electricity mains.



5.2.3 Filling the Kettle

Prior to operating the unit, clean out the kettle pan thoroughly, using hot water and detergent.

Kettle capacities:

Model	Kettle Capacity
TDH-20	18.9 Litres
TDH-40	37.9 Litres

These are maximum capacities. To prevent surge boiling, no more than 80% of the maximum capacity should be used during operation.

5.2.4 User's Thermostat

Provides automatic control of the Kettle Jacket temperature at selected settings to a maximum of 147°C.

5.2.5 Sequence of Operation

The following "sequence of operation" outline is provided to help the user understand how the unit functions.

When the operator sets a temperature on the thermostat dial, the thermostat switch closes and sends a signal which (1) starts the spark and (2) opens the automatic valve for the burners.

The spark ignites the burner on low flow. The flame completes a circuit at the sensing probe and sends a signal that causes the spark to shut off and the automatic valve to open to full flow once a flame has been detected. If a flame is not detected within 15 seconds the gas is automatically cut-off and the appliance is locked-out. The unit can only be re-lit once the reset button has been pressed.

In addition to the lockout timer, safety features include:

a) Low-water cut-off relay that will shut off the gas supply to all burners until the water level is corrected.

b) High pressure switch, set to open at about 46 PSIG and shut down the burners until jacket pressure is decreased.

c) Pop safety valve, which will release steam if the jacket pressure exceeds 50 PSIG. See detailed Instructions pertaining to Safety Valve installation and operation. (Paragraphs 3.2 and 3.20)

d) Tilt cut-off switch that shuts off all burners when the kettle is tilted.

When the kettle reaches the set temperature, the thermostat switch opens, stopping the signal to the gas control valve and causing the valve to shut off all gas flow. When the kettle cools below the set temperature, the thermostat switch closes and starts another heating cycle. On-off cycling continues and maintains the kettle at the desired temperature.

5.2.6 To Empty Kettle

5.2.6.1 Crank Tilt Models: To tilt the body of the kettle forward, turn the hand crank on the front of the cabinet anti-clockwise. The body will stay in the position when you stop turning the handle. To return the body to the upright position, turn the crank clockwise.

5.2.6.2 Pull Tilt Models: The kettle is designed to be tilted in a controlled manner. Grasp the insulated plastic ball firmly. Maintain a firm grip on the handle when tilting, while keeping the kettle body in a tilted position, and when **slowly** returning the kettle body to an upright position.

WARNING
DO NOT STAND IN FRONT OF THE KETTLE BODY WHEN TILTING IT. BE CAREFUL TO KEEP HOT CONTENTS FROM SPILLING. ENSURE PEOPLE ARE KEPT AWAY FROM THE KETTLE WHEN EMPTYING IT.

5.2.7 Power Failure

If the power to the unit fails, do not attempt to operate the appliance until the electricity supply is re-established.

When the power comes back on, follow the steps in Initial Kettle Lighting and Operational Readiness Check (Paragraph 5.2.1).

5.3 Cleaning and Maintenance

IMPORTANT

Disconnect the electricity supply before any cleaning is undertaken. The appliance must not be cleaned with a jet of water nor should it be steam cleaned.

5.3.1 Suggested Tools

a) Detergent and sanitizing agent, or a combination cleaning - sanitizing agent.

b) Kettle brushes, long handled and short handled.

5.3.2 Precautions

Before cleaning operation, shut off the burner by turning the thermostat dial to "OFF". If water or cleaning/sanitizing solution will be sprayed, shut off all electric power to the unit at a remote switch such as the circuit breaker.

WARNING
KEEP WATER AND SOLUTIONS OUT OF CONTROLS, GEARS, BURNERS, ETC. NEVER SPRAY OR HOSE THE CONTROL CONSOLE, ELECTRICAL CONNECTIONS, TILTING MECHANISM OR CABINET.

5.3.3 Procedure

a) Clean all food contact surfaces as soon as possible after use, preferably while the kettle is still hot. If the unit is in continuous use, thoroughly clean and sanitise both interior and exterior at least once every 12 hours.

b) Scrape and flush out large amounts of food residues. Be careful not to scratch the kettle with metal implements.

c) Prepare a hot solution of the detergent/cleaning compound as instructed by the supplier. Clean the unit thoroughly. A cloth moistened with cleaning solution can be used to clean controls, control housings and electrical conduit.

d) Rinse the kettle thoroughly with hot water, then drain completely.

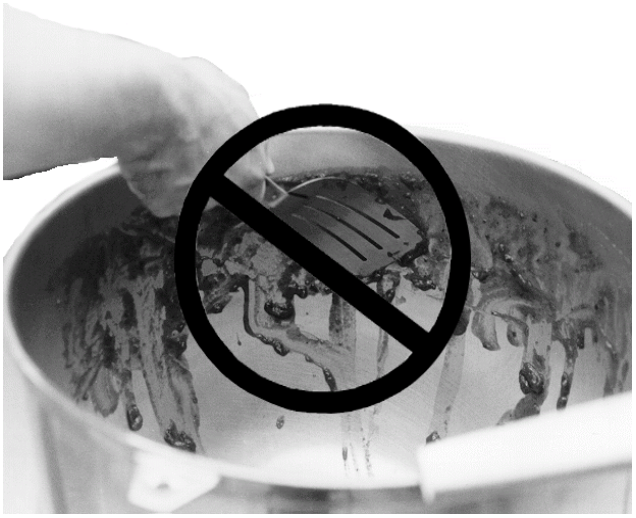
e) As part of the daily cleaning program, clean all external and internal surfaces that may have been soiled. Remember to check such parts as the underside of the kettle and control housing.

f) To remove materials stuck to the equipment, use a brush, sponge, cloth, plastic or rubber scraper, or plastic wool with the detergent solution. To minimize the effort required in washing, let the detergent solution sit in the kettle and soak into the residue, or heat the detergent solution briefly.

g) Do not use any abrasive materials or metal implement that might scratch the surface. Scratches make the surface hard to clean and provide places for bacteria to grow. DO NOT use steel wool, which may leave particles imbedded in the surface and cause eventual corrosion and pitting.

h) The exterior of the unit may be polished with a recognized stainless steel cleaner or with hot water and detergent.

Use a brush, cloth, sponge or other non-abrasive tool for cleaning.



Don’t use metal implements or steel wool.

i) When the equipment needs to be sanitized, use a sanitizing solution equivalent to one that supplies 200 parts per million available chlorine. Obtain advice on the best sanitizing agent from your supplier of sanitizing products. Following the suppliers instructions, apply the sanitizing agent after the unit has been cleaned and drained. Rinse off the sanitizing agent thoroughly.

CAUTION
NEVER LEAVE A CHLORINE SANITIZING AGENT IN CONTACT WITH STAINLESS STEEL FOR MORE THAN 30 MINUTES. LONGER CONTACT CAN CAUSE CORROSION.

j) It is recommended that the unit be sanitized before use.

k) If there is difficulty removing mineral deposits or a film left by hard water or food residues, clean the kettle thoroughly and use a deliming agent, such as Groen Delimer Descaler (P/N 114800) or LimeAway from Eco-Lab Inc. in accordance with the manufacturer's directions. Rinse and drain the unit thoroughly before further use.

l) If especially difficult cleaning problems persist, contact your cleaning product supplier for assistance.

5.3.4 Safety Precautions

A stopcock will be fitted in the gas pipe supplying the appliance. The user must be familiar with its location and operation to be able to be turn it off in an emergency. If there is a smell of gas, turn off the gas, ventilate the area and call the gas supplier. Do not search for gas leaks with naked flames.

5.3.5 Service-Periodic Maintenance

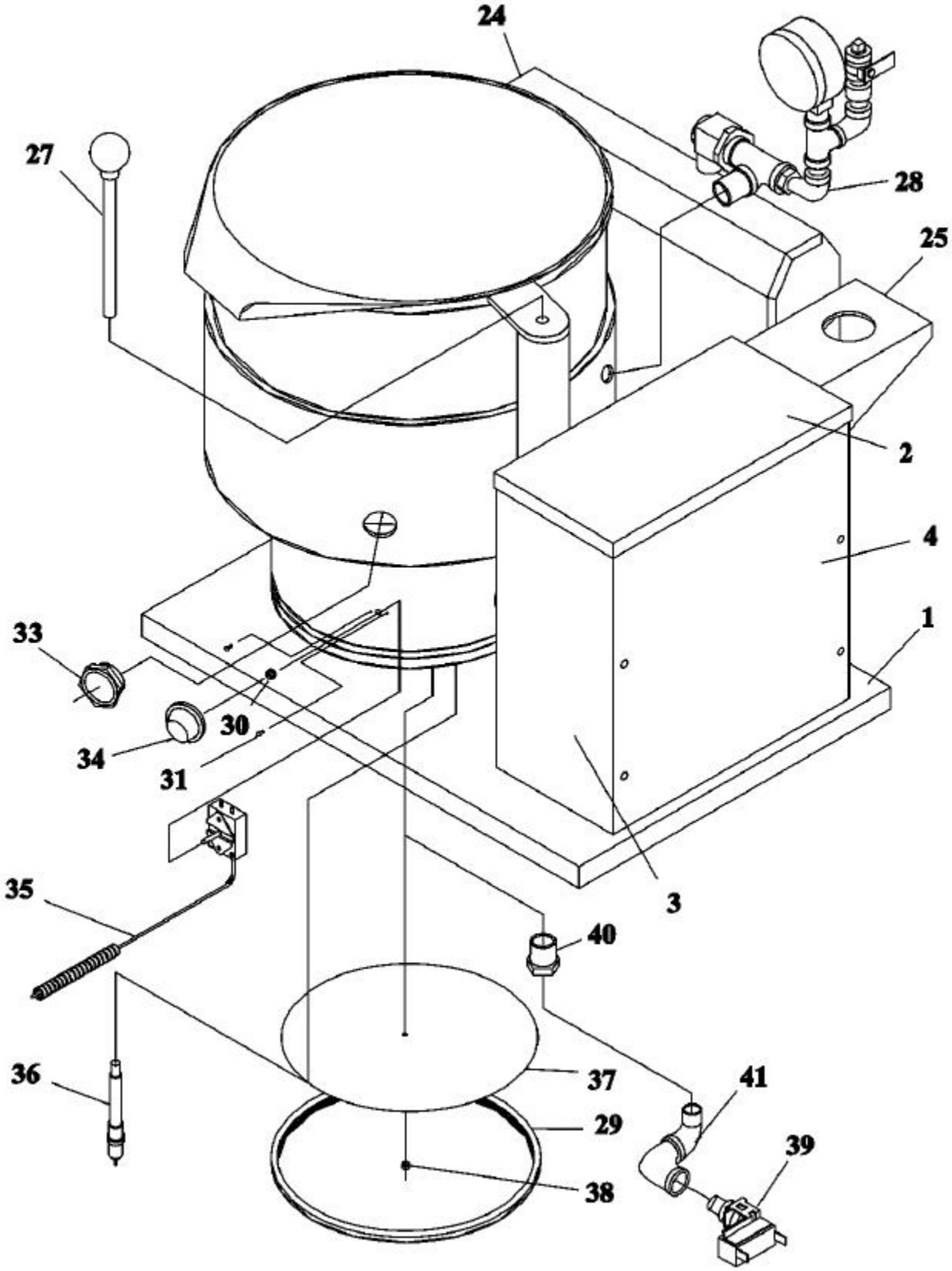
A Maintenance and Service Log is included in this manual. Each time maintenance is performed, enter the date the work was done, what was done, and who did it. Periodic inspection can minimize equipment down time and increase the efficiency of operation. The following points should be checked regularly:

a) The pressure/vacuum gauge should show a vacuum of 20 to 30 inches when the kettle is cold. If it does not, the unit needs servicing.

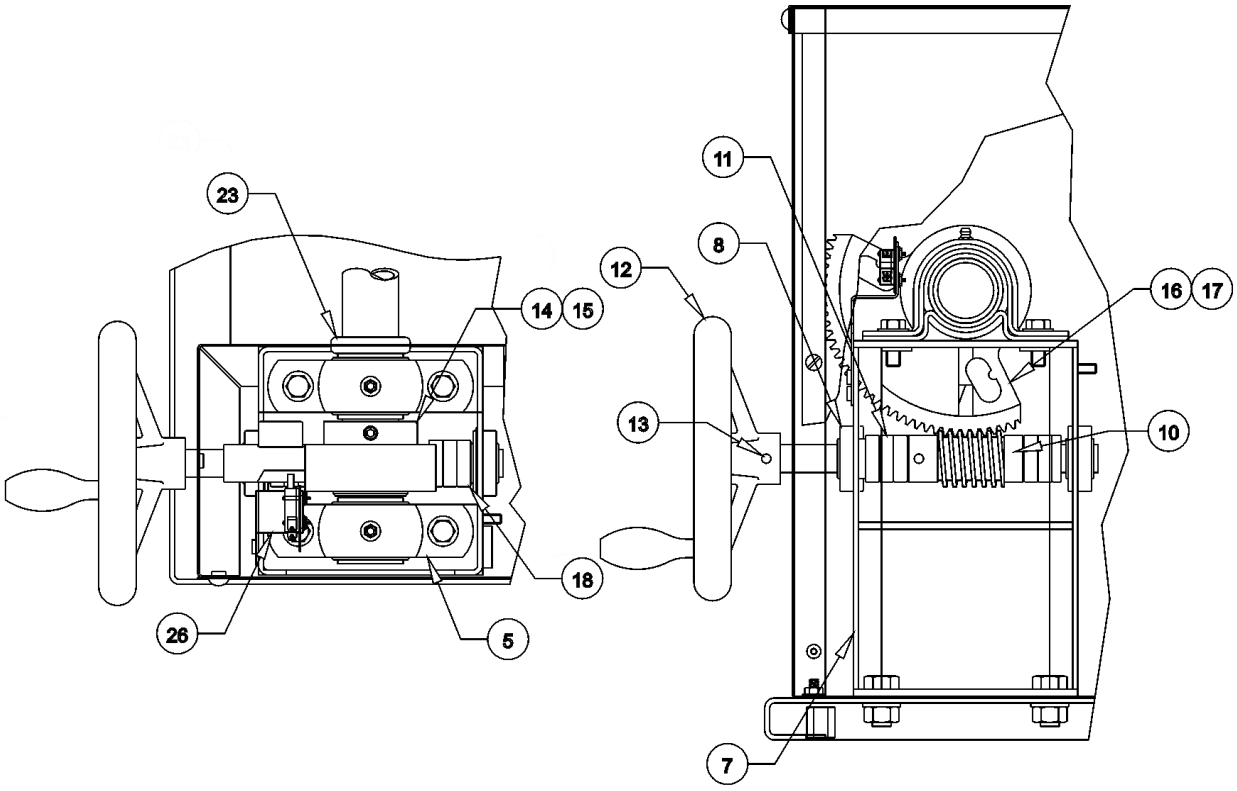
b) Jacket water level should be between gauge glass marks. If not, the unit needs servicing.

c) Keep electrical wiring in good condition.

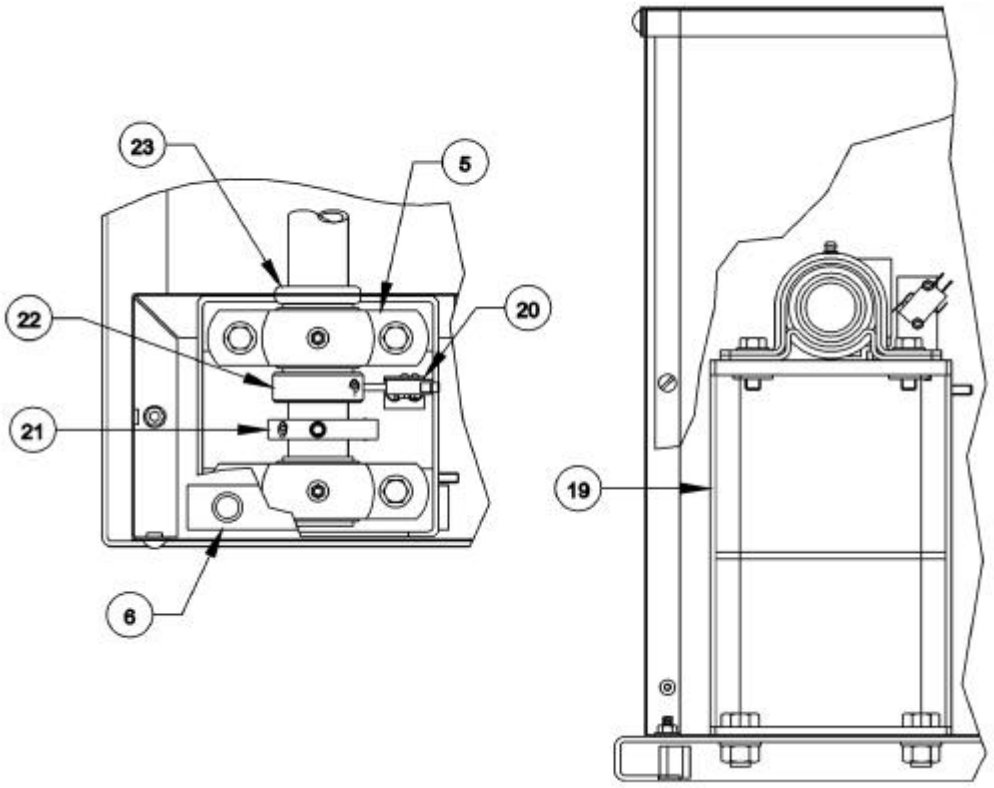
Parts List



Parts List



CRANK TILT MODELS



PULL TILT MODELS

Parts List

(Keyed to Drawings on Pages 23 and 24)

To order parts, contact your Groen Certified Service Agency. Supply the model designation, part description, part number, quantity, and, where applicable, voltage and phase.

Key	Description	P/N	H	C	Key	Description	P/N	H	C
1	Base Weldment (TDH-40)	113082	x	x	22	Set collar	065528	x	
	Base Weldment (TDH-20)	113083	x	x	23	Grommet	003492	x	x
2	Cladding, top, pedestal	113052	x	x	24	Flue Stack Assembly	090686	x	x
3	Cladding, side, pedestal (TDH-40)	113051	x	x	25	Faucet Bracket	009054	x	x
	Cladding, side, pedestal (TDH-20)	113079	x	x	26	Tilt switch & bracket assembly	113074		x
4	Cladding, panel, pedestal (TDH-40)	113053	x	x	27	Pull Handle Assembly	012965	x	
	Cladding, panel, pedestal (TDH-20)	113080	x	x	28	Safety Valve Assembly (Steam)	005801	x	x
5	Pillow block, 1-1/2" bore	002989	x	x		Pressure Gauge	084208	x	x
6	Shim	122031	x	x		Safety Valve (Steam)	097005	x	x
7	Pedestal, machined (TDH-40)	113050		x		Waterfill Assembly	096923	x	x
	Pedestal, machined (TDH-20)	113095		x		Check Valve	096915	x	x
8	Bearing with snap ring	002790		x		Ball Valve	096916	x	x
9	Worm shaft	113057		x	29	Gasket, Bottom Cover	007937	x	x
10	Worm gear 3/4" bore	012026		x	30	Thermostat Adapter	107172	x	x
11	Spacer Washer	084956		x	31	Screw, Rd Hd #6-32 x 3/8"	009697	x	x
12	Hand wheel	012061		x	32	--			
13	Roll pin, 1/4" x 1"	012614		x	33	Bullseye Sight Glass	108554	x	x
14	Gear bushing	113055		x	34	Thermostat Knob	122054	x	x
15	Set screw, socket 3/8-16 x 1"	005593		x	35	Thermostat	012313	x	x
16	Gear sector, 12 DP	009829		x	36	Water Level Probe	015589	x	x
17	Key, 1/4" sq x 1-1/4" round ends	009262		x	37	Bottom Cover	003141	x	x
18	Spacer washer 1/4"	122117		x	38	Nut, Hex 1/4" x 20	012940	x	x
19	Pedestal, weldment (TDH-40)	128835	x		39	Pressure Switch	096963	x	x
	Pedestal, weldment (TDH-20)	128834	x		40	Reducing Bushing, 1/2" x 1/4 NPT	008739	x	x
20	Tilt switch & bracket assembly	127635	x		41	Elbow Assembly	101543	x	x
	Tilt Switch	002982	x	x		Washer, Lock, 3/8" MS [4]	005702	x	x
	Nut, Hex #4-30 [2]	003121	x	x		Washer, Lock, 3/8" SS [4]	005618	x	x
	Screw, Rd Hd #4-40 x 3/4" [2]	003122	x	x		Screw, Hex 3/8-16 x 1" SS [4]	005612	x	x
	Washer, #4-40 [2]	013418	x	x		Screw Hex 1/2-13 x 1" SS [4]	005622	x	x
	Bracket, Tilt Switch	113062		x		Washer, Lock, 1/2" [4]	005735	x	x
	Bracket, Tilt Switch	127636	x			Nut, Hex, 1/2-13 [4]	005705	x	x
21	Stop assembly	065527	x						

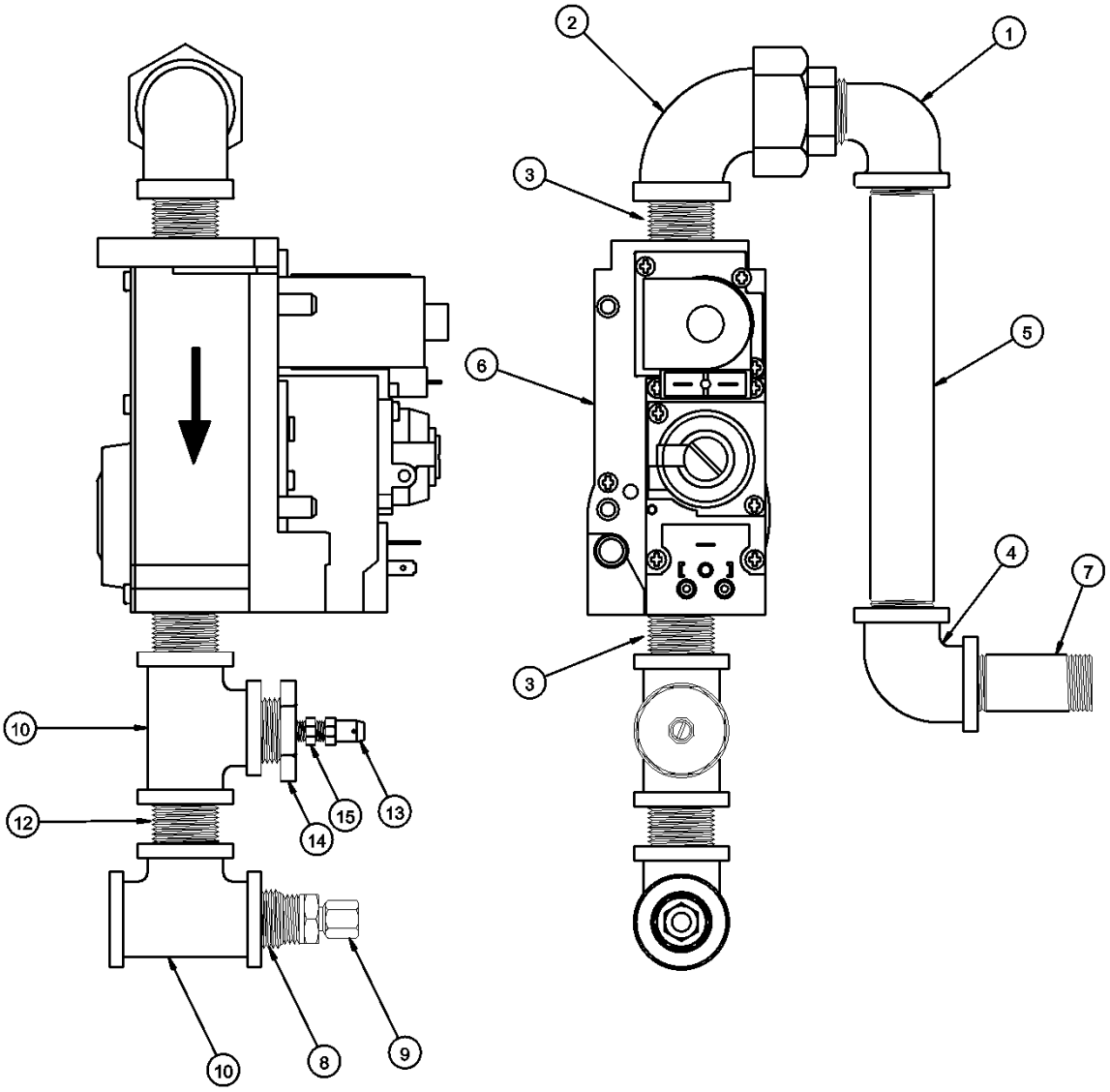
H = Pull Tilt Model

C = Crank Tilt Models

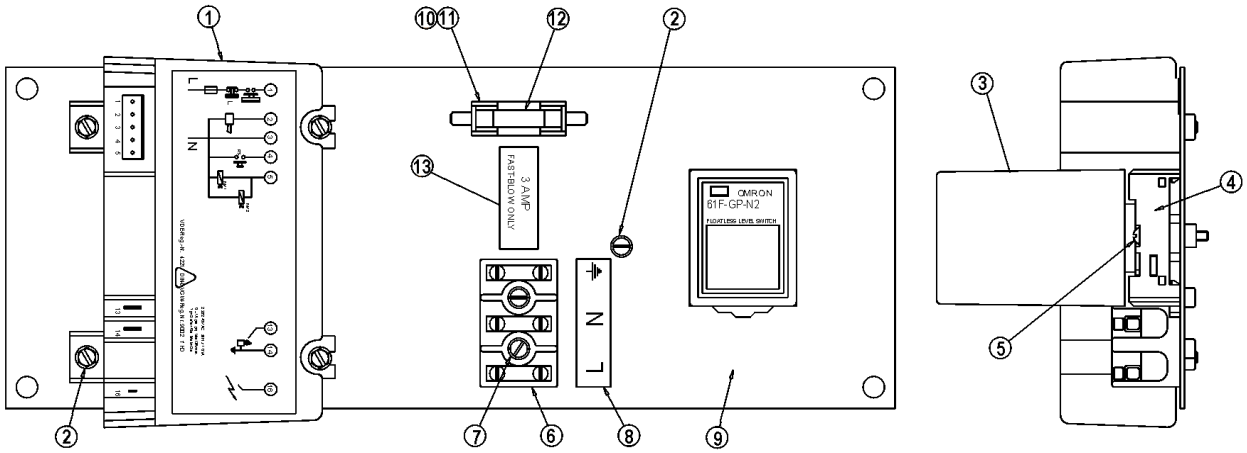
"–" = Item not shown in illustrations

"[n]" = Quantity required

Parts List



Gas Valve and Piping Assembly, TDH-20 and TDH-40 Natural and Propane Gas CE Models



Electrical Panel Assembly, TDH-40 and TDH-20 CE Models

Parts List

(Keyed to Drawing on Page 26)

To order parts, contact your Groen Certified Service Agency. Supply the model designation, part description, part number, quantity, and, where applicable, voltage and phase.

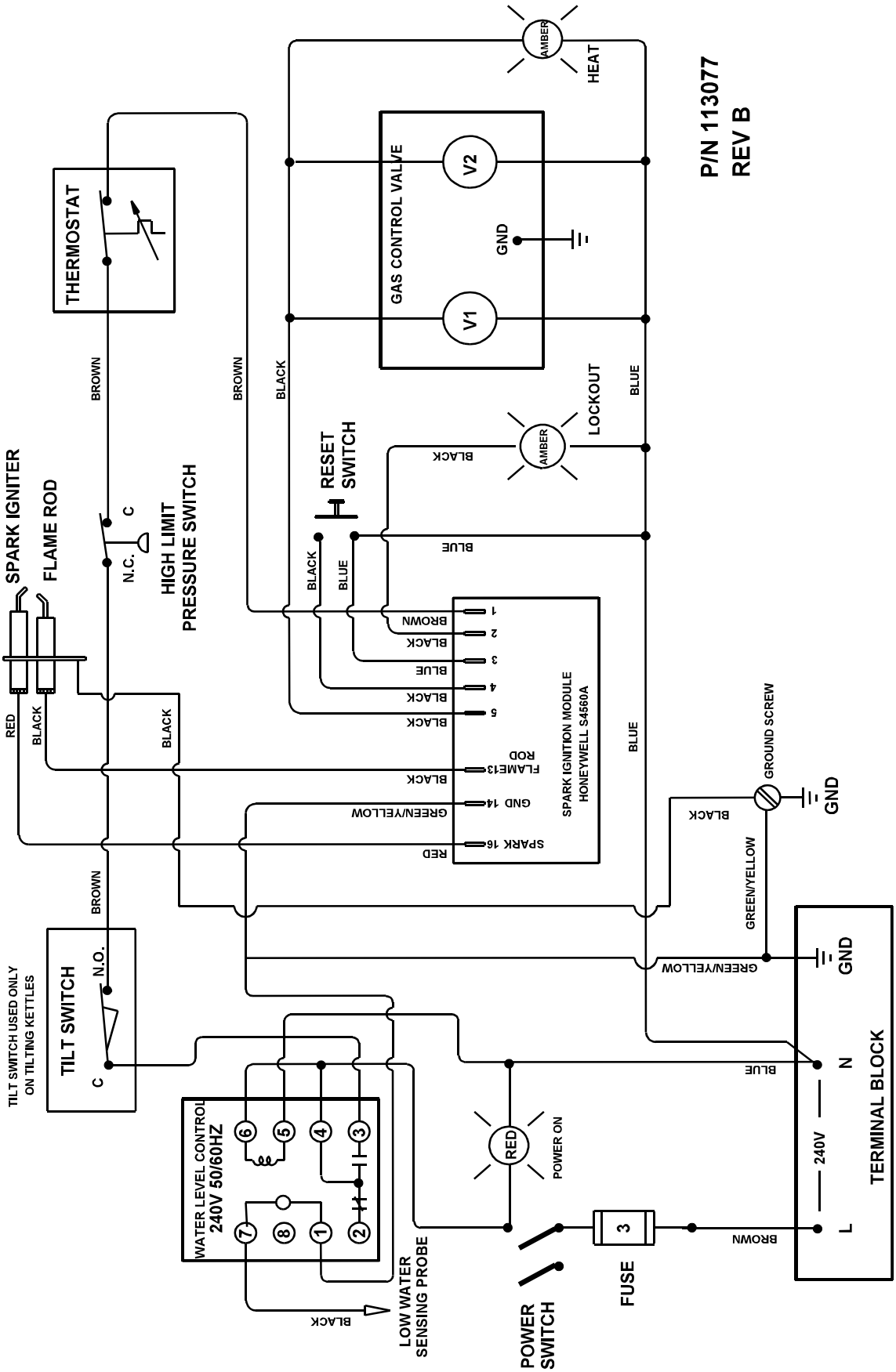
Key	Description	P/N	TDH-20	TDH-40
	Gas Combustion Parts			
	G25 Gas Conversion Kit (from G20)	128884	x	
	G25 Gas Conversion Kit (from G20)	128885		x
	Gas Valve & Piping Assy (Complete)	113065	x	x
1	90º Street Elbow 1/2" NPT (black)	004185	x	x
2	Union Elbow 1/2" NPT (black)	005495	x	x
3	Nipple Close 1/2"BSPTx1/2"NPT [2]	116394	x	x
4	90º Elbow 1/2" NPT (black)	008747	x	x
5	Nipple, 1/2" NPT x 8" long (black)	005557	x	x
6	Gas Valve (Natural & Propane)	114505	x	x
7	Nipple, 1/2" NPT x 2" long	005551	x	x
8	Bushing, Reducing, 1/2" x 3/8" NPT	012355	x	x
9	Connector, 3/8" MNPT x 1/4" Tube	054498	x	x
10	Tee, 1/2" NPT (black)	008772	x	x
12	Nipple, 1/2" 1/2" Close BT	008877	x	x
13	Gas Test Nipple	117051	x	x
14	Bushing, Reducing 1/2" x 1/8" NPT	088290	x	x
15	Adapter 1/8" f. BSPx1/8" m. NPTF	122087	x	x
--	Burner & Manifold Assy (G20 Gas)	113066A		x
--	Burner & Manifold Assy (G20 Gas)	113068A	x	
--	Manifold Assembly	040822		x
--	Burner Jets (1.09 mm) for G20 [12]	091845		x
--	Manifold Assy w/burner jets G20	097054C	x	
--	Burner Jets (0.94 mm) for G20 [8]	127562	x	
--	Pilot Burner & Orifice Assy G20/G25	117700	x	x
--	Pilot Tubing	113088	x	x
--	Sensing Probe (pilot)	003328	x	x
--	Connector 3/8"MNPTx1/4" tube	054498	x	x
--	Adapter, gas 1/2" BPST x 1/2"NPT	116390	x	x
--	Flue Stack Assembly	090686		x
--	Flue Stack Assembly	093605	x	
--	Gas Inlet Valve	098458	x	x

Key	Description	P/N	TDH-20	TDH-40
	Electrical Parts			
1	Pilot Ignition Controller 220V/240V	113060	x	x
2	Screw hex washer #8-32x3/8" [5]	069789	x	x
3	Water Level Sensor Relay	117737	x	x
4	Base, Relay Socket	117738	x	x
5	Screw, rd head 6-32 x1" lg [2]	012631	x	x
6	Terminal Block (3 pole)	003119	x	x
7	Screw, rnd hd #8-32x5/8" lg [2]	007526	x	x
8	Label, Supply Voltage	114316	x	x
9	Panel, electrical mounting	117726	x	x
10	Fuse Holder	077854	x	x
11	Screw, rd hd #6-32 x 1/4" lg	018384	x	x
12	Fuse, Three Amp (250V)	079965	x	x
13	Label, “3 Amp (Fast Blow Only)”	102251	x	x
14	Electrical Panel Assembly complete	113069	x	x
--	Equipotential Terminal Assembly	122021	x	x
--	Light, Indicator, Red	116381	x	x
--	Light, Indicator Amber	116382	x	x
--	Switch, Pushbutton, Momentary	122003	x	x
--	Switch, Toggle	122004	x	x
--	Wire Harness	113081	x	x

“[n]” = Quantity required

“–“ = Item not shown or called out in illustrations

Wiring Diagram



Service Log

Model **m** _____ Purchased From _____

Serial **m** _____ Location _____

Date Purchased _____ Date Installed _____

Purchase Order **m** _____ For Service Call _____

Date	Service Performed	Performed By

*Limited Warranty To Commercial Purchasers**

(for Areas Outside of the U.S. and Canada)

Groen Foodservice Equipment ("Groen Equipment") has been skillfully manufactured, carefully inspected and packaged to meet rigid standards of excellence. Groen warrants its Equipment to be free from defects in material and workmanship for (12) twelve months from date of installation or (18) eighteen months from date of shipment with the following conditions and subject to the following limitations.

I. This parts warranty is limited to Groen Equipment sold to the original commercial purchaser. users (but not original equipment manufacturers), at its original place of installation, in areas outside the U.S. and Canada.

II. Damage during shipment is to be reported to the carrier, is not covered under this warranty, and is the sole responsibility of the purchaser/user.

III. Groen, or an authorized service representative, will repair or replace parts, at Groen's sole election, for any Groen Equipment, including but not limited to, drawoff valves, safety valves, gas and electric components, found to be defective during the warranty period.

IV. This warranty does not cover boiler maintenance, calibration, or periodic adjustments as specified in operating instructions or manuals, and consumable parts such as scraper blades, gaskets, packing, etc., or labor costs incurred for removal of adjacent equipment or objects to gain access to Groen Equipment. This warranty does not cover defects caused by improper installation, abuse, careless operation, or improper maintenance of equipment. This warranty does not cover damage caused by poor water quality or improper boiler maintenance.

V. THIS WARRANTY IS EXCLUSIVE AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, EACH OF WHICH IS HEREBY EXPRESSLY DISCLAIMED. THE REMEDIES DESCRIBED ABOVE ARE EXCLUSIVE AND IN NO EVENT SHALL GROEN BE LIABLE FOR SPECIAL, CONSEQUENTIAL OR INCIDENTAL DAMAGES FOR THE BREACH OR DELAY IN PERFORMANCE OF THIS WARRANTY.

VI. Groen Equipment is for commercial use only. If sold as a component of another (O.E.M.) manufacturer's equipment or if used as a consumer product, such Equipment is sold AS IS and without any warranty.

* (Covers All Food Service Equipment Ordered After October 1,1995)

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A DOVER COMPANY

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